

WHAT IS CLAIMED IS:

1. A starter for cranking an internal combustion engine having a ring gear, the starter comprising:

an electric motor;

an output shaft driven by the electric motor;

a pinion gear unit including a pinion gear and a rotation-restricting ring fixedly connected to the pinion gear, the rotation-restricting ring having a series of depressions formed on its outer periphery, the pinion gear unit being helical-spline-coupled to the output shaft so that the pinion gear unit is pushed forward toward the ring gear to thereby engage with the ring gear when the output shaft is slowly rotated by the electrical motor and rotation of the pinion gear unit is restricted; and

a rotation-restricting member adapted to be engaged with the depressions of the rotation-restricting ring to restrict rotation of the pinion gear unit, wherein:

the pinion gear and the rotation-restricting ring are separately formed from each other and fixedly connected together in a co-axial relation.

2. The starter as in claim 1, further comprising a member for restricting backward movement of the pinion gear unit when the pinion gear is engaged with the ring gear, wherein:

the pinion gear unit further includes a bearing member connected to the rotation-restricting ring for

absorbing friction between the rotation-restricting ring and the member for restricting backward movement of the pinion gear unit; and

the bearing member is separately formed from the pinion gear and the rotation-restricting ring, and connected to the pinion gear.

3. The starter as in claim 1, further comprising a member for restricting backward movement of the pinion gear unit when the pinion gear is engaged with the ring gear, wherein:

the pinion gear unit further includes a bearing member integrally formed with the rotation-restricting ring for absorbing friction between the rotation-restricting ring and the member for restricting backward movement of the pinion gear unit.

4. The starter as in claim 2, wherein:

the rotation-restricting ring and the bearing member are first connected to each other, thereby forming a rotation-restricting unit, and the rotation-restricting unit is fixedly connected to the pinion gear.

5. The starter as in claim 4, wherein:

the pinion gear has a cylindrical portion extending to its axial direction;

the rotation-restricting unit is fixedly connected to the cylindrical portion not to cause relative rotation between the pinion gear and the rotation-restricting unit; and

a stopper means for preventing movement of the rotation-restricting unit in the axial direction is provided on an axial end of the cylindrical portion.

6. The starter as in claim 5, wherein:

the stopper means is a member formed separately from the cylindrical portion of the pinion gear and fixed to the cylindrical portion after the rotation-restricting unit is connected to the cylindrical portion.

7. The starter as in any one of claims 2-6, wherein:

the bearing member includes sealing means for preventing foreign particles or liquid from entering into the bearing member.

8. The starter as in any one of claims 2-6, wherein:

the bearing member is a thrust bearing for reducing abrasive force in the axial direction of the pinion gear unit.

9. The starter as in any one of claims 2-6, wherein:

the bearing member is a radial bearing for reducing abrasive force in the radial direction of the pinion gear unit.